

REMARKS

Claims 1 – 23, 26, 28 – 48 and 50 – 57 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejection(s) in view of the amendments and remarks contained herein.

DRAWINGS

The drawings stand objected to for certain informalities. Applicants have attached revised drawings for the Examiner's approval. In the "Replacement Sheet," box 200 in Fig. 3 has been labeled.

REJECTION UNDER 35 U.S.C. § 103

Claims 1 – 56 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Barbisch (U.S. Pat. No. 6,013,993) in view of Zick et al. (U.S. Pat. No. 6,236,177),¹ Torikoshi et al. (U.S. Pub. Apr. No. 2002/0056858) and DE3636555. Applicants respectfully traverse this rejection.

Applicants have amended claim 1 so that it now recites, *inter alia*, that the motor braking circuit is adjustable to vary at least one of a duty cycle and frequency of the sequence of pulses that cycles the braking power switching device open and closed. Applicants submit that none of the references applied by the Examiner disclose varying at least one a duty cycle and frequency of a sequence of pulses used to cycle a braking power switching device open and closed. At best, they disclose intermittently switching a switching device coupled across the windings of a motor [see, e.g., Barbisch]. Applicants submit that amended claim 1 is thus allowable.

¹ The Examiner cites to Zich et al. as opposed to Zick et al. Applicants assume that this was a typographical error as Applicants have not cited in their IDS's any patent to Zich et al. If not, applicants respectfully request that the Examiner identify the Zich et al. patent by number and allow applicants an opportunity to respond.

Claims 1 – 15 depend directly or indirectly from amended claim 1 and are allowable for at least that reason.

Further, claim 9 requires that the internal diode of the FET that is used as the braking power switching device be used in lieu of a separate diode across the windings of the motor. The Examiner cited Torikoshi et al. as disclosing a FET with an internal diode and takes the position that it, combined with the other three references, renders claim 9 obvious. However, Torikoshi et al. does not disclose eliminating a separate diode across the windings of the motor, which is a freewheeling diode as discussed in the application [Application, Par. 9], and instead using the internal diode of the FET as the freewheeling diode. Applicants are not claiming in claim 9 a FET having an internal diode. Rather, applicants are claiming in claim 9 that the internal diode of the FET be used in lieu of a separate external diode. Applicants submit that Torikoshi et al. does not disclose using the internal diode of its FET in lieu of a separate diode across the windings of the motor, and such is not disclosed in the other three references. Applicants submit that claim 9 is allowable for also this reason.

Applicants have also amended independent claim 16 so that it now recites, *inter alia*, that the controller (that generates a sequence of pulses that switch the FET coupled across windings of the motor on and off) is adjustable to vary at least one of a duty cycle and a frequency of the sequence of pulses. For the reasons discussed above with respect to claim 1, applicants submit that amended claim 16 is allowable.

Claims 17 – 21 depend directly or indirectly from amended claim 16 and are allowable for at least that reason.

Applicants have also amended independent claim 22 and submit that as amended, it is allowable. More specifically, amended independent claim 22 now recites, *inter alia*, that the FET coupled across the motor windings has an internal diode and that this internal diode of the FET acts as a freewheeling diode in lieu of a separate diode. For the reasons discussed above with respect to claim 9, applicants submit that amended claim 22 is allowable.

Claims 23, 26 and 28 – 37 depend directly or indirectly from amended claim 22 and are allowable for at least that reason.

Amended claim 30 requires that a module that houses the trigger switch also house the FET that is coupled across the motor windings. Applicants submit that none of the references applied by the Examiner disclose a module that both houses a trigger switch and the FET that is coupled across the motor windings. Applicants submit that claim 30 is also allowable for this reason.

Claim 31 recites that the controller controls braking of the motor by varying at least one of a duty cycle and frequency of a pulse width modulated signal that the controller outputs to the FET. Applicants submit that claim 31 is also allowable for the reasons discussed above with respect to amended claim 1.

Applicants have also amended independent claim 38, which is directed to a power tool, and submit that as amended, claim 38 is allowable. More specifically, amended independent claim 38 now recites, *inter alia*, that the controller is adjustable to vary at least one of a duty cycle and a frequency of the sequence of pulses that cycles the braking switching device open and closed. Applicants submit that amended

independent claim 38 is allowable for at least the reasons discussed above with respect to amended claim 1.

Claims 39 – 46 depend directly or indirectly from amended independent claim 38 and are allowable for at least that reason.

Claim 40 requires that the internal diode of the FET that is used as the semiconductor switch across the motor windings acts as a freewheeling diode in lieu of a separate freewheeling diode. Applicants submit that for at least for the reasons discussed above with respect to claim 9, claim 40 is allowable.

Claim 42 requires that the module that houses the trigger switch also house the braking switching device. Applicants submit that none of the references applied by the Examiner disclose a module that houses both the trigger switch and the braking switching device. Applicants submit that claim 42 is also allowable for these reasons.

Applicants have amended independent claim 47 and submit that as amended, independent claim 47 is allowable. More specifically, amended independent claim 47 recites, *inter alia*, adjusting at least one of a duty cycle and frequency of the pulsating signal that pulses the braking switching device coupled across windings of the motor. For at least the reasons discussed above with respect to amended independent claim 1, applicants submit that amended independent claim 47 is allowable.

Applicants have also amended independent claim 51, which is directed to a cordless power tool, so that it now recites, *inter alia*, adjusting at least one of a duty cycle and frequency of the pulsating signal that pulses the semiconductor switch coupled across windings of the motor. Applicants have similarly amended independent claim 54, which is directed to a mains powered power tool. For the reasons discussed

with respect to amended independent claim 1, applicants submit that amended independent claims 52 and 54 are allowable.

Claims 52 and 53 depend directly or indirectly from amended independent claim 52 and are allowable for at least that reason. Claims 55 and 56 depend directly or indirectly from amended independent claim 55 and are allowable for at least that reason.

Amended claim 53 requires that the internal diode of the MOSFET that is used as the semiconductor switch be used as a freewheeling diode in lieu of a separate diode. Applicants submit that amended claim 53 is thus also allowable for at least the reasons discussed above with respect to claim 9.

New claim 57, which is directed to a power tool, recites, *inter alia*, that the internal diode of the FET that is coupled across the motor windings act as a freewheeling diode and be used in lieu of a separate freewheeling diode. For the reasons discussed above with respect to claim 9, applicants submit that claim 57 is allowable.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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AMENDMENTS TO THE DRAWINGS

The attached "Replacement Sheet" of drawings includes changes to Figure 3. The attached "Replacement Sheet," which includes Figure 3, replaces the original sheet of Figure 3.

Attachment: Replacement Sheet